

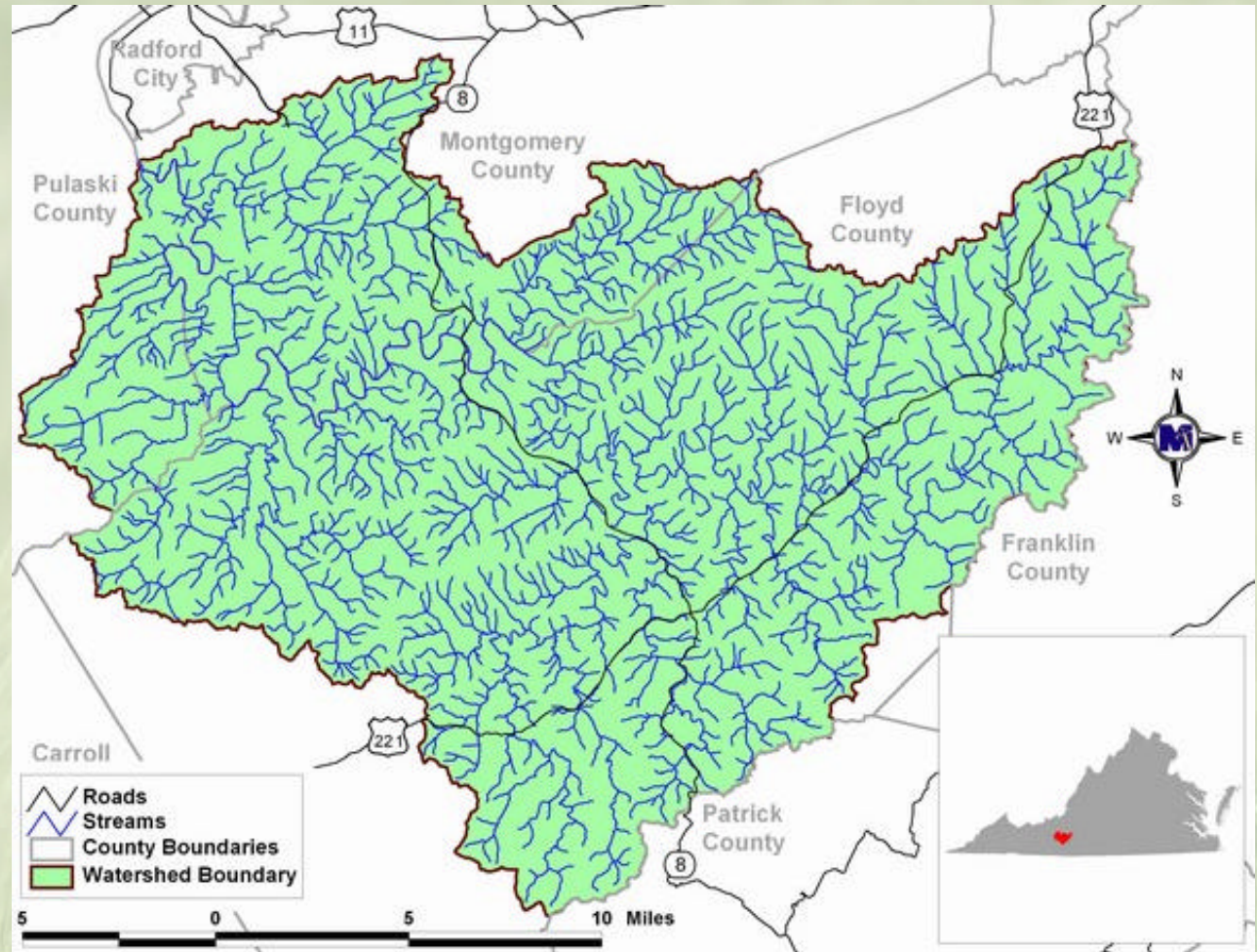


Little River and Tributaries TMDL Final Public Meeting & Implementation Plan Kickoff

March 16, 2011

Drainage Area

- Parts of Floyd, Montgomery, and Pulaski counties
- Approximately 225,000 acres
- Forest ~ 57%
- Pasture/Hay ~ 37%
- Cropland <1%
- Developed ~ 4% (contains Town of Floyd)



Bacteria Impairments

Waterbody	Polluted Segment
Little River	From near the headwaters to the New River confluence.
Meadow Run	From the headwaters downstream to the confluence with Little River.
Pine Creek	From the impounding structure of a pond downstream to the Little River confluence
Meadow Creek	From the Mill Creek confluence downstream to the Little River confluence.
Brush Creek	From the Rt. 617 bridge downstream to the Little River confluence
Laurel Creek	From its headwaters downstream to the Little River confluence.

Benthic Impairments (Sediment)

Waterbody	Polluted Segment
Little River	West Fork Little River confluence downstream to the confluence with Sidney Creek.
Meadow Run	From the headwaters downstream to the confluence with Little River.

Temperature Impairments

Waterbody	Polluted Segment	Temperature Standard
Little River	Confluence with Payne Creek downstream to the confluence with West Fork Little River.	Natural Trout Max. Temp 20C
West Fork Dodd Creek	From an unnamed tributary downstream the confluence with Dodd Creek.	Natural Trout Max. Temp 20C
Pine Creek	Confluence with Meadow Creek downstream to the PWS section.	Natural Trout Max. Temp 20C
Big Indian Creek	0.5 miles upstream from the West Fork Big Indian Creek confluence downstream to the confluence with Little River.	Stockable Trout Max Temp 21C
Dodd Creek	West Fork Dodd Creek confluence downstream to the West Fork Little River confluence.	Stockable Trout Max Temp 21C

TMDL Approach

- Identify and quantify contributors to the problem;
- Incorporate the drainage area's characteristics and pollutant parameters to establish the baseline for existing conditions;
- Determine the necessary reductions for achievement of the standard or endpoint.

How do we Determine the TMDLs?



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Watershed data



TMDL

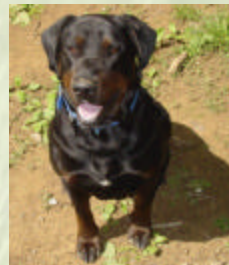
TMDL Equation:

$$\frac{\begin{array}{l} \text{WLA (point sources)} \\ \text{LA (non point sources)} \\ + \text{MOS (margin of safety)} \end{array}}{\text{TMDL}}$$



Where does Bacteria in the stream come from?

- Permitted discharges
 - Wastewater treatment facilities
 - Other Permitted Discharges
- Human
 - Biosolids
 - Failed Septic Systems
 - Straight Pipes
 - Overflows
- Pets
- Livestock
- Wildlife



Where does Sediment in the stream come from?

- Permitted discharges
- Land clearing for construction
- Agricultural activities
- Forest harvesting
- Accumulation in developed areas
- Streambank erosion

What causes High Temperatures in the stream?

Loss of shading in stream corridors



Remedies for Bacteria Problem

- Eliminate straight pipe contribution
- Reduce livestock access to streams by 73%



Bacteria TMDL

Impairment	WLA (cfu / yr)	LA (cfu / yr)	MOS	TMDL ² (cfu / yr)
Little River (watershed outlet)	1.13E+13	1.12E+15	<i>Implicit</i>	1.13E+15

WLA – Waste Load Allocation

LA – Load Allocation

MOS – Margin of Safety

TMDL – Total Maximum Daily Load



Remedies for Sediment Problem

Source	Needed Reductions
Barren	18%
High Tillage Cropland	18%
Disturbed Forest	18%
Unimproved Pasture	18%
Streambank Erosion	18%
Straight Pipes	100%

Sediment TMDL

Impairment	WLA (t / yr)	LA (t / yr)	MOS (t / yr)	TMDL (t / yr)
Little River	116.49	8,050.34	907.46	9,074.29

WLA – Waste Load Allocation

LA – Load Allocation

MOS – Margin of Safety

TMDL – Total Maximum Daily Load

Remedies for Temperature Problem

- Establish forested buffers around the streams with a total length of 297,011 ft



Temperature TMDL

Impairment	WLA (joules/m ² /s)	LA (joules/m ² /s)	MOS	TMDL (joules/m ² /s)
Little River & Pine Creek	1.03	101.69	<i>Implicit</i>	102.72
West Fork Dodd Creek	0.99	98.09		99.08
Dodd Creek	0.82	80.99		81.81
Big Indian Creek	1.2	119.01		120.21

WLA – Waste Load Allocation

LA – Load Allocation

MOS – Margin of Safety

TMDL – Total Maximum Daily Load

Specific Management Measures

Measure	Unit	Amount	Impacted Pollutants
Livestock Fencing	ft	917,000	Bacteria, Sediment
Sewer System Hookup for Straight Pipes	system	57	Bacteria, Sediment
Septic System Installation for Straight Pipes	system	300	Bacteria, Sediment
E&S	acre	30	Sediment
Conservation Tillage	acre	18	Bacteria, Sediment
Reforestation of Disturbed Forest	acre	270	Bacteria, Sediment
Forest Harvesting Best Management Practices	acre	270	Bacteria, Sediment
Improved Pasture Management	acre	3,670	Bacteria, Sediment
Forested Riparian Buffer	ft	297,011	Temperature, Bacteria, Sediment



- Public Review
- Submit to EPA
- State Approval
- Implementation



Contact Information

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We appreciate that you're taking the time to come to the meeting.

We appreciate your feedback.

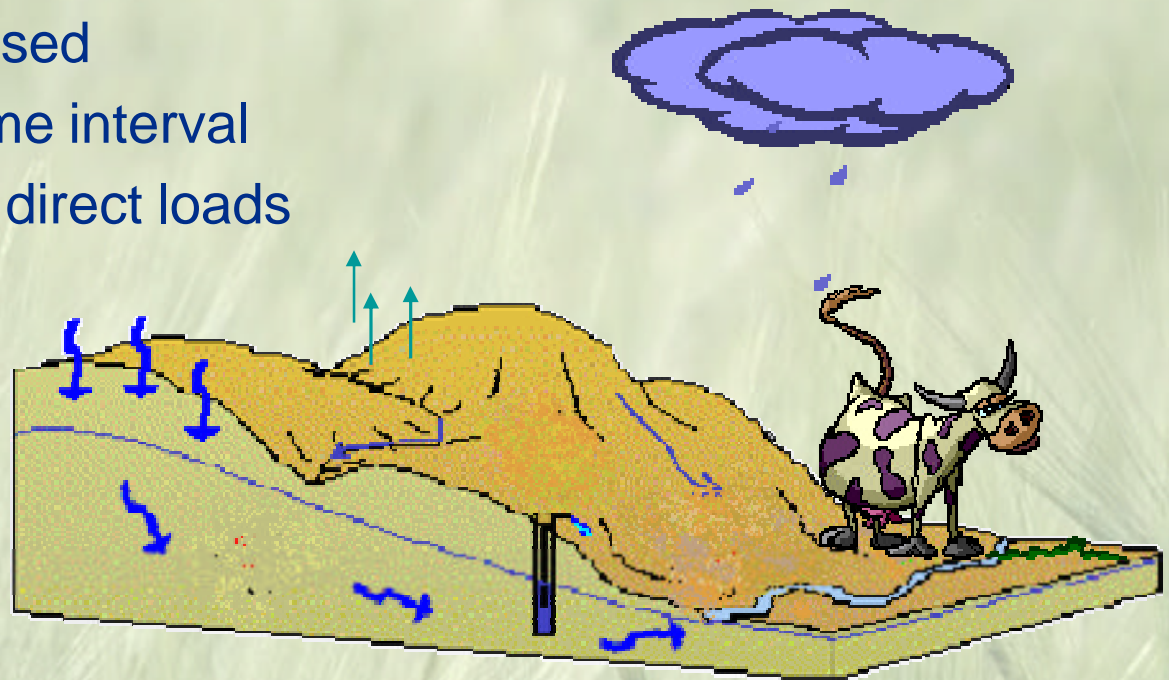


Appendix A

Modeling

Modeling - Bacteria

- Rainfall-Runoff-Water Quality
 - Hydrologic Simulation Program – Fortran (HSPF)
 - ◆ Watershed-based
 - ◆ Continuous time interval
 - ◆ Land-applied, direct loads



Conceptual Model

